



General

Guideline Title

Updated CDC recommendations for the management of hepatitis B virus–infected health-care providers and students.

Bibliographic Source(s)

Centers for Disease Control and Prevention (CDC). Updated CDC recommendations for the management of hepatitis B virus–infected health-care providers and students. MMWR Recomm Rep. 2012 Jul 6;61(RR-3):1-12. [65 references] [PubMed](#)

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

Note from the Centers for Disease Control and Prevention (CDC): *This report updates the 1991 CDC recommendations for the management of hepatitis B virus (HBV)–infected health-care providers and students to reduce risk for transmitting HBV to patients during the conduct of exposure-prone invasive procedures (CDC. Recommendations for preventing transmission of human immunodeficiency virus and hepatitis B virus to patients during exposure-prone invasive procedures. MMWR 1991;40[No. RR-8]). This update reflects changes in the epidemiology of HBV infection in the United States and advances in the medical management of chronic HBV infection and policy directives issued by health authorities since 1991.*

The previous recommendations have been updated to include the following changes: no prenotification of patients of a health-care provider's or student's HBV status; use of HBV DNA serum levels rather than hepatitis B e-antigen status to monitor infectivity; and, for those health-care professionals requiring oversight, specific suggestions for composition of expert review panels and threshold value of serum HBV deoxyribonucleic acid (DNA) considered "safe" for practice (<1,000 IU/ml). These recommendations also explicitly address the issue of medical and dental students who are discovered to have chronic HBV infection. For most chronically HBV-infected providers and students who conform to current standards for infection control, infection status alone does not require any curtailing of their practices or supervised learning experiences.

Recommendations for Chronically HBV-Infected Health-Care Providers and Students

Practice Scope

Chronic HBV infection in itself should not preclude the practice or study of medicine, surgery, dentistry, or allied health professions. Standard Precautions should be adhered to rigorously in all health-care settings for the protection of both patient and provider.

CDC discourages constraints that restrict chronically HBV-infected health-care providers and students from the practice or study of medicine, dentistry, or surgery, such as:

- Repeated demonstration of persistently nondetectable viral loads on a greater than semiannual frequency
- Prenotification of patients of the HBV-infection status of their care giver
- Mandatory antiviral therapy with no other option such as maintenance of low viral load without therapy
- Forced change of practice, arbitrary exclusion from exposure-prone procedures, or any other restriction that essentially prohibits the health-care provider from practice or the student from study

Hepatitis B Vaccination and Screening

All health-care providers and students should receive hepatitis B vaccine according to current CDC recommendations (Advisory Committee on Immunization Practices (ACIP) & CDC, 2011; Mast et al., 2006; CDC, 2012). Vaccination (3-dose series) should be followed by assessment of hepatitis B surface antibody (anti-HBs) to determine vaccination immunogenicity and, if necessary, revaccination. Health-care providers who do not have protective concentration of anti-HBs (>10 mIU/ml) after revaccination (i.e., after receiving a total of 6 doses) should be tested for hepatitis B surface antigen (HBsAg) and antibody to hepatitis B core antigen (anti-HBc) to determine their infection status (ACIP & CDC, 2011).

Prevaccination serologic testing is not indicated for most persons being vaccinated, except for those providers and students at increased risk for HBV infection (ACIP & CDC, 2011), such as those born to mothers in or from endemic countries and sexually active men who have sex with men (Weinbaum et al., 2008).

Providers who are performing exposure-prone procedures also should receive prevaccination testing for chronic HBV infection. Exposure of a patient to the blood of an HBV-infected health-care provider, in the performance of any procedure, should be handled with postexposure prophylaxis and testing of the patient in a manner similar to the reverse situation (i.e., prophylaxis for providers exposed to the blood of an HBV-infected patient) ("Updated U.S. Public Health Service guidelines," 2001).

Expert Panel Oversight Not Needed

Providers, residents, and medical and dental students with active HBV infection (i.e., those who are HBsAg-positive) who do not perform exposure-prone procedures but who practice non- or minimally invasive procedures (see Category II, Box below) should not be subject to any restrictions of their activities or study. They do not need to achieve low or undetectable levels of circulating HBV DNA, hepatitis e-antigen negativity, or have review and oversight by an expert review panel, as recommended for those performing exposure-prone procedures. However, they should receive medical care for their condition by clinicians, which might be in the setting of student or occupational health.

Expert Panel Oversight Recommended

Surgeons, including oral surgeons, obstetrician/gynecologists, surgical residents, and others who perform exposure-prone procedures, i.e., those listed under Category I activities (see Box below), should fulfill the following criteria:

- Consonant with the 1991 recommendations and Advisory Committee on Immunization Practices (ACIP) recommendations (ACIP & CDC, 2011), their procedures should be guided by review of a duly constituted expert review panel with a balanced perspective (i.e., providers' and students' personal, occupational or student health physicians, infectious disease specialists, epidemiologists, ethicists and others as indicated above) regarding the procedures that they can perform and prospective oversight of their practice (Henderson et al., 2010). Confidentiality of the health-care provider's or student's HBV serologic status should be maintained.
- HBV-infected providers can conduct exposure-prone procedures if a low or undetectable HBV viral load is documented by regular testing at least every 6 months unless higher levels require more frequent testing; for example, as drug therapy is added or modified or testing is repeated to determine if elevations above a threshold are transient.
- CDC recommends that an HBV level 1,000 IU/ml (5,000 GE/ml) or its equivalent is an appropriate threshold for a review panel to adopt. Monitoring should be conducted with an assay that can detect as low as 10-30 IU/ml, especially if the individual institutional expert review panel wishes to adopt a lower threshold.
- Spontaneous fluctuations (blips) of HBV DNA levels and treatment failures might both present as higher-than-threshold (1,000 IU/ml; 5,000 GE/ml) values. This will require the HBV-infected provider to abstain from performing exposure-prone procedures, while subsequent retesting occurs, and if needed, modifications or additions to the health-care provider's drug therapy and other reasonable steps are taken.

Institutional Policies and Procedures

Hospitals, medical and dental schools, and other institutions should have written policies and procedures for the identification and management of HBV-infected health-care providers, students, and school applicants. These policies should include the ability to identify and convene an expert

review panel (see the "Description of Implementation Strategy" field) aware of these and other relevant guidelines and recommendations before considering the management of HBV-infected providers performing exposure-prone procedures.

Box. CDC Classification of Exposure-Prone Patient Care Procedures	
Category I. Procedures known or likely to pose an increased risk of percutaneous injury to a health-care provider that have resulted in provider-to-patient transmission of hepatitis B virus (HBV)	Category II. All other invasive and noninvasive procedures
<p>These procedures are limited to major abdominal, cardiothoracic, and orthopedic surgery, repair of major traumatic injuries, abdominal and vaginal hysterectomy, caesarean section, vaginal deliveries, and major oral or maxillofacial surgery (e.g., fracture reductions). Techniques that have been demonstrated to increase the risk for health-care provider percutaneous injury and provider-to-patient blood exposure include:</p> <ul style="list-style-type: none"> • Digital palpation of a needle tip in a body cavity and/or • The simultaneous presence of a health care provider's fingers and a needle or other sharp instrument or object (e.g., bone spicule) in a poorly visualized or highly confined anatomic site. <p>Category I procedures, especially those that have been implicated in HBV transmission, are not ordinarily performed by students fulfilling the essential functions of a medical or dental school education.</p>	<p>These and similar procedures are not included in Category I as they pose low or no risk for percutaneous injury to a health-care provider or, if a percutaneous injury occurs, it usually happens outside a patient's body and generally does not pose a risk for provider-to-patient blood exposure. These include:</p> <ul style="list-style-type: none"> • Surgical and obstetrical/gynecologic procedures that do not involve the techniques listed for Category I • The use of needles or other sharp devices when the health-care provider's hands are outside a body cavity (e.g., phlebotomy, placing and maintaining peripheral and central intravascular lines, administering medication by injection, performing needle biopsies, or lumbar puncture) • Dental procedures other than major oral or maxillofacial surgery • Insertion of tubes (e.g., nasogastric, endotracheal, rectal, or urinary catheters) • Endoscopic or bronchoscopic procedures • Internal examination with a gloved hand that does not involve the use of sharp devices (e.g., vaginal, oral, and rectal examination) • Procedures that involve external physical touch (e.g., general physical or eye examinations or blood pressure checks).

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Hepatitis B virus (HBV) infection

Guideline Category

Evaluation

Management

Prevention

Risk Assessment

Screening

Treatment

Clinical Specialty

Dentistry

Family Practice

Gastroenterology

Infectious Diseases

Internal Medicine

Obstetrics and Gynecology

Preventive Medicine

Surgery

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Dentists

Health Care Providers

Hospitals

Nurses

Other

Patients

Physician Assistants

Physicians

Public Health Departments

Students

Guideline Objective(s)

- To update the 1991 Centers for Disease Control and Prevention (CDC) recommendations for the management of hepatitis B virus (HBV)–infected health-care providers and students to reduce risk for transmitting HBV to patients during the conduct of exposure-prone invasive procedures
- To promote patient safety while providing risk management and practice guidance to HBV-infected health-care providers and students, particularly those performing exposure-prone procedures such as certain types of surgery
- To emphasize prevention of operator injuries and blood exposures during exposure-prone surgical, obstetrical, and dental procedures

- To outline the criteria for safe clinical practice of HBV-infected providers and students that can be used by the appropriate occupational or student health authorities to develop their own institutional policies

Target Population

Hepatitis B virus (HBV)-infected health-care providers and students

Note: This report is intended to guide the practices of chronically HBV-infected providers and students and the institutions that employ, oversee, or train them; it does not address those with acute HBV infection. This report is limited to the provider-to-patient transmission of HBV; it does not address infection control measures to prevent bloodborne transmission of HBV to patients through receipt of human blood products, organs, or tissues because these measures have been described elsewhere. Nor does this report provide comprehensive guidance about prevention of patient-to-health-care provider bloodborne pathogen transmission because this guidance also has been published previously.

Interventions and Practices Considered

1. Adherence to Standard Precautions in all health-care settings for the protection of both patient and provider
2. Provision of hepatitis B vaccine to all health-care providers and students
3. Assessment of hepatitis B surface antibody (anti-HBs) to determine vaccination immunogenicity and, if necessary, revaccination
4. Testing for hepatitis B surface antigen (HBsAg) and antibody to hepatitis B core antigen (anti-HBc) to determine infection status in individuals who do not have protective concentrations of anti-HBs (>10 mIU/ml) after revaccination
5. Prevaccination serologic testing, when appropriate
6. No restrictions on activities or study for providers and students who do not perform exposure-prone procedures
7. Expert panel oversight for surgeons and others who perform exposure-prone procedures
8. Regular testing for hepatitis B virus (HBV) viral load for HBV-infected providers who conduct exposure-prone procedures
9. Adoption of institutional policies and procedures for the identification and management of HBV-infected health-care providers, students, and school applicants

Major Outcomes Considered

- Incidence of health-care provider-to-patient transmission of hepatitis B virus (HBV)
- Incidence and prevalence of acute HBV infection in the United States
- Effectiveness of treatment for chronic hepatitis B infection
- Effectiveness of safety prevention strategies (work practice and engineering controls)
- Effectiveness of monitoring practices for HBV deoxyribonucleic acid (DNA) level and hepatitis B e antigen (HBeAg)
- Safe HBV DNA levels

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

To update recommendations for the risk management of hepatitis B virus (HBV)-infected health-care providers and students, the Centers for Disease Control and Prevention (CDC) considered data that have become available since the 1991 recommendations were published. Information reviewed was obtained through literature searches both by standard search engines (PubMed) and of other literature reviews used in guidelines

developed by other professional organizations since 1991. Search terms used included "hepatitis B," "hepatitis B virus," or "HBV" with "healthcare," "health-care," "healthcare workers" or "providers" or "personnel"; "nosocomial" or "healthcare transmission"; and "healthcare worker-to-patient." However, these searches did not identify additional cases beyond the few already known to CDC and the experts consulted.

To gather data on HBV transmission, CDC reviewed all hepatitis B outbreak investigations conducted by CDC and state officials since 1991. CDC national hepatitis surveillance data were examined for reports of acute HBV infection in persons with information about recent health care, as well as reports received regarding dismissal of HBV infected health-care providers (i.e., surgeons) or prohibition from matriculation of medical, dental, and osteopathic students identified as HBV-infected after acceptance (see "Actions Taken Against HBV-Infected Health Care Providers and Students" in the original guideline document).

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Not stated

Rating Scheme for the Strength of the Evidence

Not applicable

Methods Used to Analyze the Evidence

Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Medical, dental, infection control, public health, infectious disease, and hepatology experts, officials, and representatives from government, academia, the public, organizations representing medical, dental and osteopathic colleges, and professional medical organizations were consulted (see list of persons consulted in the original guideline document). Some were consulted at an initial meeting on June 4, 2011. All experts and organizations were provided draft copies of these recommendations as they were developed, and they provided insights, information, suggestions, and edits. In finalizing these recommendations, the Centers for Disease Control and Prevention (CDC) considered all available information, including expert opinion, results of the literature review, findings of outbreak investigations, surveillance data, and reports of adverse actions taken against hepatitis B virus (HBV)-infected surgeons and students.

On the basis of a thorough literature review, reports of providers who experienced curtailed scope of practice, and expert consultation, CDC considered the following issues when developing these recommendations: 1) very rare or, for most types of clinical practice, no detected transmission of HBV from providers to patients; 2) nationally decreasing trends in the incidence of acute HBV infection in both the general population and health-care providers; 3) successful implementation and efficacy of policies promoting hepatitis B vaccination; 4) evolving and improving therapies for HBV infection; 5) guidelines in the United States and other developed countries that propose expert-based approaches to the risk management of infected health-care providers; 6) the adoption of Standard Precautions (formerly known as universal precautions) as a primary prevention intervention for the protection of patients and providers from infectious agent transmission; 7) the implementation of improved

work practice and engineering controls, including safety devices; 8) the testing and vaccination of providers; 9) increasing availability of HBV viral load testing; and 10) instances of restrictions or prohibitions for HBV-infected providers and students that are not consistent with CDC and other previous recommendations.

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Comparison with Guidelines from Other Groups

Peer Review

Description of Method of Guideline Validation

The Centers for Disease Control and Prevention compared their recommendations with those of other guideline groups. Guidelines from the American College of Surgeons and the Society for Healthcare Epidemiology of America were reviewed as well as guidelines published by some European countries and in Canada (see Table 2 in the original guideline document). No guidelines from any developed country recommend the systematic prohibition of invasive surgical or dental practices by qualified health-care providers whose chronic hepatitis B virus (HBV) infection is monitored.

Evidence Supporting the Recommendations

References Supporting the Recommendations

Advisory Committee on Immunization Practices, Centers for Disease Control and Prevention (CDC). Immunization of health-care personnel: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep. 2011 Nov 25;60(RR-7):1-45.
[PubMed](#)

Centers for Disease Control and Prevention (CDC). Recommended adult immunization schedule--United States, 2012. MMWR Morb Mortal Wkly Rep. 2012 Feb 3;61(4):1-7. [1 reference]

Henderson DK, Dembry L, Fishman NO, Grady C, Lundstrom T, Palmore TN, Sepkowitz KA, Weber DJ, Society for Healthcare Epidemiology of America. SHEA guideline for management of healthcare workers who are infected with hepatitis B virus, hepatitis C virus, and/or human immunodeficiency virus. Infect Control Hosp Epidemiol. 2010 Mar;31(3):203-32. [154 references] [PubMed](#)

Mast EE, Weinbaum CM, Fiore AE, Alter MJ, Bell BP, Finelli L, Rodewald LE, Douglas JM Jr, Janssen RS, Ward JW, Advisory Committee on Immunization Practices (ACIP) Centers for Disease Control and Prevention. A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices (ACIP) Part II: immunization of adults. MMWR Recomm Rep. 2006 Dec 8;55(RR-16):1-33; quiz CE1-4. [3 references] [PubMed](#)

Updated U.S. Public Health Service guidelines for the management of occupational exposures to HBV, HCV, and HIV and recommendations

Weinbaum CM, Williams I, Mast EE, Wang SA, Finelli L, Wasley A, Neitzel SM, Ward JW, Centers for Disease Control and Prevention (CDC). Recommendations for identification and public health management of persons with chronic hepatitis B virus infection. *MMWR Recomm Rep*. 2008 Sep 19;57(RR-8):1-20. [145 references] [PubMed](#)

Type of Evidence Supporting the Recommendations

The type of supporting evidence is not specifically stated for each recommendation.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Reduced risk of transmission of hepatitis B virus from health care providers and students to patients with proper monitoring and management

Potential Harms

Not stated

Qualifying Statements

Qualifying Statements

- Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.
- References to non-Centers for Disease Control and Prevention (CDC) sites on the Internet are provided as a service to *MMWR* readers and do not constitute or imply endorsement of these organizations or their programs by CDC or the U.S. Department of Health and Human Services. CDC is not responsible for the content of these sites. URL addresses listed in *MMWR* were current as of the date of publication.

Implementation of the Guideline

Description of Implementation Strategy

Guidance for Expert Review Panels at Institutions

Hepatitis B virus (HBV) infection in health-care providers and students who do not perform invasive exposure-prone procedures should be managed as a personal health issue and does not require special panel oversight. However, for providers who perform exposure-prone procedures, all recent guidelines advocate the constitution of an expert panel to provide oversight of the infected health-care provider's practice.

For HBV-infected providers performing exposure-prone procedures, expert review panels should evaluate the infected provider's clinical and viral burden status; assess his or her practices, procedures and techniques, experience, and adherence to recommended surgical and dental technique; provide recommendations, counseling, and oversight of the provider's continued practice or study within the institution; and investigate and notify appropriate persons and authorities (e.g., risk management or, if need be, licensure boards) for suspected and documented breaches in procedure or incidents resulting in patient exposure. The panel should reinforce the need for Standard Precautions (e.g., double gloving, regular glove changes, and use of blunt surgical needles). Panels may appropriately provide counseling about alternate procedures or specialty paths, especially for providers, students, residents, and others early in their careers, as long as this is not coercion or limitation (perceived or actual) of the provider

or student.

The members of the expert review panel may be selected from, but should not necessarily be limited to, the following: one or more persons with expertise in the provider's specialty; infectious disease and hospital epidemiology specialists; liver disease specialists (gastroenterologists); the infected providers' occupational health, student health, or primary care physicians; ethicists; human resource professionals; hospital or school administrators; and legal counsel. Certain members of the panel should be familiar with issues relating to bloodborne pathogens and their infectivity.

In instances when it is generally accepted (or thought) that a patient might have been exposed to the blood of an infected health-care provider, institutions should have in place a protocol for communicating to the patient that such an exposure might have occurred. The patient should receive appropriate follow-up including post-exposure vaccination or receipt of hepatitis B immune globulin and testing (i.e., similar to the reverse situation of prophylaxis for providers exposed to the blood of an HBV-infected patient).

The confidentiality of the infected provider or student should be respected. Certain expert review panels might elect to consider cases without knowledge of the name of the infected provider or student. However, awareness of the infected provider's or student's identity might be unavoidable. In such cases, respect for the confidentiality of the person under review should be accorded as it is for any other patient.

Implementation Tools

Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Living with Illness

IOM Domain

Effectiveness

Safety

Identifying Information and Availability

Bibliographic Source(s)

Centers for Disease Control and Prevention (CDC). Updated CDC recommendations for the management of hepatitis B virus-infected health-care providers and students. MMWR Recomm Rep. 2012 Jul 6;61(RR-3):1-12. [65 references] [PubMed](#)

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2012 Jul 6

Guideline Developer(s)

Centers for Disease Control and Prevention - Federal Government Agency [U.S.]

Source(s) of Funding

United States Government

Guideline Committee

Not stated

Composition of Group That Authored the Guideline

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Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the [Centers for Disease Control and Prevention \(CDC\) Web site](#) .

Print copies: Available from the Centers for Disease Control and Prevention, *MMWR*, Atlanta, GA 30333. Additional copies can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-9325; (202) 783-3238.

Availability of Companion Documents

A variety of resources on health care settings and viral hepatitis, including immunization practices and state laws, are available from the [Centers for Disease Control and Prevention Web site](#) .

Patient Resources

None available

NGC Status

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